

Please provide the following information, and submit to the NOAA DM Plan Repository.

Reference to Master DM Plan (if applicable)

As stated in Section IV, Requirement 1.3, DM Plans may be hierarchical. If this DM Plan inherits provisions from a higher-level DM Plan already submitted to the Repository, then this more-specific Plan only needs to provide information that differs from what was provided in the Master DM Plan.

URL of higher-level DM Plan (if any) as submitted to DM Plan Repository:

1. General Description of Data to be Managed**1.1. Name of the Data, data collection Project, or data-producing Program:**

Integrated Hard and Soft Bottom Seafloor Substrate Maps at Tutuila Island in American Samoa, and Guam and Saipan Islands in the Mariana Archipelago

1.2. Summary description of the data:

Substrate—hard vs. soft bottom—from 0-50m depths around Tutuila in American Samoa, and Guam and Saipan in the Mariana Archipelago. This is a preliminary product, derived from integrating two existing map products: hard and soft seafloor substrate maps derived from an unsupervised classification of multibeam backscatter and bathymetry derivatives, produced by NOAA Pacific Island Fisheries Science Center Coral Reef Ecosystem Program (CREP), and shallow-water benthic habitat maps generated by NOAA Center for Coastal Monitoring and Assessment Biogeography Branch. The resulting maps were then updated with CREP's ground truth data, including biological survey data and benthic cover data derived from the analysis of benthic images. Production of final maps included interpolation to fill in gaps, smoothing to remove isolated pixels, and extracting the substrate data within 50-m contours.

1.3. Is this a one-time data collection, or an ongoing series of measurements?

One-time data collection

1.4. Actual or planned temporal coverage of the data:

2003 to 2010, 2001 to 2003, 2003 to 2007, 2002 to 2008, 2003, 2004 to 2006

1.5. Actual or planned geographic coverage of the data:

W: -170.92, E: -170.49, N: -14.2, S: -14.38

Tutuila Island, American Samoa

W: 144.55, E: 145, N: 13.7, S: 13.2

Guam Island, Mariana Archipelago

W: 145.6, E: 145.9, N: 15.3, S: 15.05

Saipan Island, Mariana Archipelago

1.6. Type(s) of data:

(e.g., digital numeric data, imagery, photographs, video, audio, database, tabular data, etc.)
Map (digital)

1.7. Data collection method(s):

(e.g., satellite, airplane, unmanned aerial system, radar, weather station, moored buoy, research vessel, autonomous underwater vehicle, animal tagging, manual surveys, enforcement activities, numerical model, etc.)

Instrument: Not applicable

Platform: Not applicable

Physical Collection / Fishing Gear: Not applicable

1.8. If data are from a NOAA Observing System of Record, indicate name of system:

1.8.1. If data are from another observing system, please specify:

2. Point of Contact for this Data Management Plan (author or maintainer)

2.1. Name:

Annette M DesRochers

2.2. Title:

Metadata Contact

2.3. Affiliation or facility:

Pacific Islands Fisheries Science Center

2.4. E-mail address:

annette.desrochers@noaa.gov

2.5. Phone number:

(808)725-5461

3. Responsible Party for Data Management

Program Managers, or their designee, shall be responsible for assuring the proper management of the data produced by their Program. Please indicate the responsible party below.

3.1. Name:

Tomoko S Acoba

3.2. Title:

Data Steward

4. Resources

Programs must identify resources within their own budget for managing the data they produce.

4.1. Have resources for management of these data been identified?

Yes

4.2. Approximate percentage of the budget for these data devoted to data management (specify percentage or "unknown"):

Unknown

5. Data Lineage and Quality

NOAA has issued Information Quality Guidelines for ensuring and maximizing the quality, objectivity, utility, and integrity of information which it disseminates.

5.1. Processing workflow of the data from collection or acquisition to making it publicly accessible

(describe or provide URL of description):

Lineage Statement:

The steps in this analysis included: 1) re-categorizing all data to simple hard/soft substrates, 2) integrating all data following data prioritization rules established by accuracy assessment, 3) filling gaps in data using interpolation, and 4) extracting the data to known depth ranges for species.

Process Steps:

- 2016-05-31 00:00:00 - First, the accuracy of two primary maps for all three islands were examined using the ground truthing data. Due to a wide area of overlap between the two datasets, it was necessary to make a decision on how to treat the two datasets in these areas. As the two datasets were produced from different methods, and from different underlying data (multibeam bathymetry versus satellite imagery) there were naturally discrepancies between the two datasets. Examination of the ground truthing data showed that the Biogeography Program shallow-water benthic habitat map provided better representations of overall classifications for all three islands. For both maps, the sand classes produced poor accuracy. This might be due to the disparity of the data acquisition time among the datasets, and the sand cover might be greatly shifted over time. Based on the accuracy assessments and uncertainties, a pragmatic decision was taken to integrate all the datasets following data prioritization rules: 1. Hard classes from ground truthing data 2. Biogeography Program shallow-water benthic habitat map 3. CREP hard-soft substrate map
- 2016-05-31 00:00:00 - For the Biogeography Program shallow-water benthic habitat map, polygons were first deleted that were not required for this product; the polygons where the Major Reef Structure (M_STRUCTURE) was either 'Unknown' or 'Other Delineations' were deleted, leaving only polygons where M_STRUCTURE was 'Coral Reef and Hardbottom' or 'Unconsolidated Sediment.' The polygon shapefile was then converted into an ArcGIS Raster, using the ArcGIS tool, 'Polygon To Raster'. The raster values were checked to ensure that the same value was equivalent to hard substrate as in the CREP hard-soft map, where 'Coral Reef and Hardbottom' was classed as 'hard' and 'Unconsolidated Sediment' was classed as 'soft'.
- 2016-05-31 00:00:00 - For the CREP hard-soft substrate, no data area was removed.
- 2016-05-31 00:00:00 - For ground-truthing data, to estimate the survey areas, 15-m radius buffers were generated around the locations of the reef fish surveys* and

coral demographic surveys and the image locations of hard classes from the TOAD. All polygons were assigned as 'hard'. Similar to the Biogeography Program shallow-water benthic habitat map, the buffer polygons were then converted into an ArcGIS Raster. *Locations of reef fish surveys are included as ground-truth data because NOAA CREP only surveys hard bottom coral reef habitats as part of its standard operating procedures to conduct reef fish surveys.

- 2016-05-31 00:00:00 - To combine the two maps and ground truthing data, all layers were mosaiced, using the ArcGIS tool, 'Mosaic To New Raster.' Based on the data prioritization rules, the two maps were first mosaiced using the 'FIRST' method of the ArcToolbox Tool 'Mosaic to new raster' where the Biogeography Program shallow-water benthic habitat map was the 'first' raster in the mosaic. This meant that where there was overlap between the two datasets, the Biogeography Program shallow-water benthic habitat map was used, and the CREP hard-soft substrate map was used to fill in gaps. Then, the ground truthing data were mosaiced with the combined map using the the 'FIRST' method where the ground truthing data was the 'first' raster in the mosaic to update the combined map. However, even using this method, artifacts in the data remain. It should also be borne in mind that the sand areas may be problematic for both primary maps; The Biogeography Program shallow water benthic habitat map may misrepresent high reflective hard substrate areas as sand, whereas the CREP hard-soft map may under-represent soft sediment at the surface, particularly if there is rocky substrate underlying the soft sediment.
- 2016-05-31 00:00:00 - Gaps were filled with interpolation in ArcGIS environment. 'Focal statistics' was used in 'Raster Calculator' tool to calculate majority value within three by three cell neighborhood for each cell location where there is no value. 'Majority filter' was then applied to remove isolated single pixels.
- Both interpolated and non-interpolated Integrated hard-soft maps were extracted using the known depth contours for ESA species using 'Extract by Mask' tool in ArcGIS. (Citation: Depth Contours for select locations across the U.S. Pacific Islands)

5.1.1. If data at different stages of the workflow, or products derived from these data, are subject to a separate data management plan, provide reference to other plan:

5.2. Quality control procedures employed (describe or provide URL of description):

The accuracy of the two existing map products used in the analysis--hard and soft seafloor substrate maps derived from an unsupervised classification of multibeam backscatter and bathymetry derivatives, produced by CREP, and shallow-water benthic habitat maps generated by NOAA Center for Coastal Monitoring and Assessment Biogeography Program--were assessed with CREP's in-situ surveys and image analysis results.

Once all data is integrated, the products were visually inspected by CREP's researchers.

6. Data Documentation

The EDMC Data Documentation Procedural Directive requires that NOAA data be well documented, specifies the use of ISO 19115 and related standards for documentation of new data, and provides links to resources and tools for metadata creation and validation.

6.1. Does metadata comply with EDMC Data Documentation directive?

Yes

6.1.1. If metadata are non-existent or non-compliant, please explain:

6.2. Name of organization or facility providing metadata hosting:

NMFS Office of Science and Technology

6.2.1. If service is needed for metadata hosting, please indicate:

6.3. URL of metadata folder or data catalog, if known:

<https://inport.nmfs.noaa.gov/inport/item/34310>

6.4. Process for producing and maintaining metadata

(describe or provide URL of description):

Metadata produced and maintained in accordance with the NMFS Data Documentation Procedural Directive: <https://inport.nmfs.noaa.gov/inport/downloads/data-documentation-procedural-directive.pdf>

7. Data Access

NAO 212-15 states that access to environmental data may only be restricted when distribution is explicitly limited by law, regulation, policy (such as those applicable to personally identifiable information or protected critical infrastructure information or proprietary trade information) or by security requirements. The EDMC Data Access Procedural Directive contains specific guidance, recommends the use of open-standard, interoperable, non-proprietary web services, provides information about resources and tools to enable data access, and includes a Waiver to be submitted to justify any approach other than full, unrestricted public access.

7.1. Do these data comply with the Data Access directive?

Yes

7.1.1. If the data are not to be made available to the public at all, or with limitations, has a Waiver (Appendix A of Data Access directive) been filed?

7.1.2. If there are limitations to public data access, describe how data are protected from unauthorized access or disclosure:

7.2. Name of organization of facility providing data access:

Pacific Islands Fisheries Science Center

7.2.1. If data hosting service is needed, please indicate:

7.2.2. URL of data access service, if known:

ftp://ftp.soest.hawaii.edu/pibhmc/website/data/amsamoa/benthichabitatlayers/tut_5m_hardsoft.zip

ftp://ftp.soest.hawaii.edu/pibhmc/website/data/cnmi-guam/benthichabitatlayers/gua_5m_hardsoft.zip

ftp://ftp.soest.hawaii.edu/pibhmc/website/data/cnmi-guam/benthichabitatlayers/sai_5m_hardsoft.zip

7.3. Data access methods or services offered:

Data can be accessed online via the Pacific Islands Benthic Habitat Mapping Center website at <http://www.soest.hawaii.edu/pibhmc/index.htm>.

7.4. Approximate delay between data collection and dissemination:

Unknown

7.4.1. If delay is longer than latency of automated processing, indicate under what authority data access is delayed:**8. Data Preservation and Protection**

The NOAA Procedure for Scientific Records Appraisal and Archive Approval describes how to identify, appraise and decide what scientific records are to be preserved in a NOAA archive.

8.1. Actual or planned long-term data archive location:

(Specify NCEI-MD, NCEI-CO, NCEI-NC, NCEI-MS, World Data Center (WDC) facility, Other, To Be Determined, Unable to Archive, or No Archiving Intended)

NCEI-MD

8.1.1. If World Data Center or Other, specify:**8.1.2. If To Be Determined, Unable to Archive or No Archiving Intended, explain:****8.2. Data storage facility prior to being sent to an archive facility (if any):**

Pacific Islands Fisheries Science Center - Honolulu, HI

8.3. Approximate delay between data collection and submission to an archive facility:

Unknown

8.4. How will the data be protected from accidental or malicious modification or deletion prior to receipt by the archive?

Discuss data back-up, disaster recovery/contingency planning, and off-site data storage relevant to the data collection

University of Hawaii School of Ocean and Earth Science and Technology, NOAA IRC and NOAA Fisheries ITS resources and assets.

9. Additional Line Office or Staff Office Questions

Line and Staff Offices may extend this template by inserting additional questions in this section.